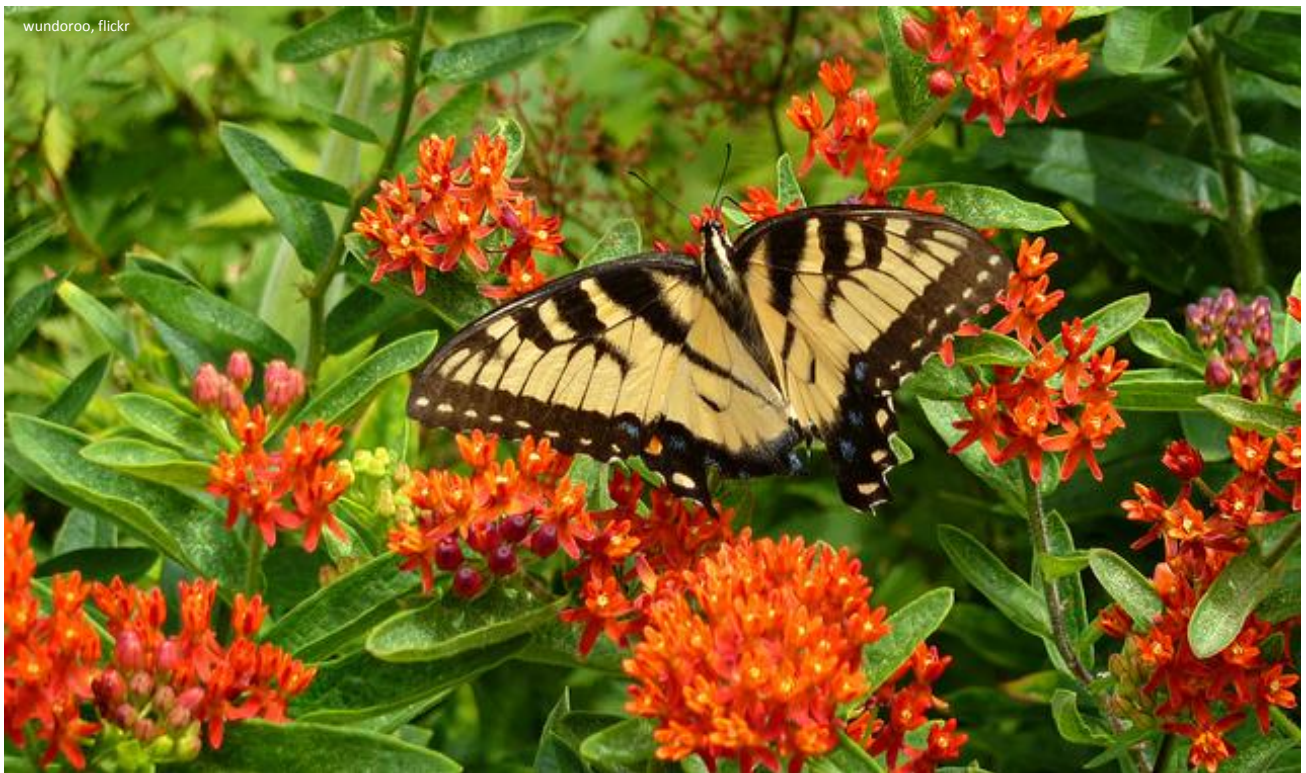


Creating Native Plant Butterfly and Moth Habitat in Georgia

Butterflies and moths are unique because they go through a process called metamorphosis.

Nectar plants for adults can be entirely different than host plants for larvae.



Butterflies are not only important pollinators, but they also make beautiful additions to any native plant garden. Here, an eastern tiger swallowtail (*Papilio glaucus*) – Georgia’s state butterfly – forages on butterfly milkweed (*Asclepias tuberosa*).

Pollinators are profoundly important to our well-being and the health of our environment. In addition to their beauty, pollinators provide an important link in our environment by moving pollen between flowers and ensuring the growth of seeds and fruits. The work of pollinators touches our lives every day through the food we eat: of the estimated 1,330 crop plants grown worldwide for food, beverages, fibers, condiments, spices, and medicines, approximately 1,000 (75%) are pollinated by animals! In the United States, approximately one out of every three bites of food you eat and beverages you drink depends on the work of a pollinating animal!

Pollination by animals is also essential for maintaining the structure and function of a wide range of habitats and ecosystems in North America. Pollination is a vital stage in the life cycle of all flowering plants: approximately 90 percent of all

plant species need the help of pollinating animals. The plant communities maintained by pollinators are an important resource for other wildlife that relies on them for food, nesting, and shelter. For example, approximately 25 percent of birds feed on fruit or seeds that serve as a major part of their diet, which is the result of pollination.

Pollinators comprise a diverse and fascinating group of wild creatures, from birds and bats to flies, beetles, wasps, ants, butterflies, moths, bees, and even the odd land mammal or reptile. About 1,000 of all pollinators are made up of vertebrates such as birds, bats, small mammals and reptiles. However, most pollinators (about 200,000 species) are comprised of beneficial insects such as flies, beetles, wasps, ants, butterflies, moths, and bees.

Like all wildlife, pollinators, such as butterflies and moths, are affected by changes in our landscape.



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And, like all wildlife, pollinators are suffering from destruction of their habitat. Intensive agriculture and forestry, housing, infrastructure, and industry destroy and fragment wild areas. Pesticides have devastated pollinator populations, and pose a constant threat to the remaining populations. The native habitat that remains often is in isolated patches and is degraded by pesticides, invasive plant species, and changes in land management. Thus, conserving and restoring the habitats and plants butterflies, moths, bees, and other beneficial insect species depend on is an important strategy for sustaining adequate numbers of plant pollinators.

Butterflies and Moths

Butterflies, moths, and caterpillars (the larval stage in the butterfly and moth life cycle) provide food for birds and other organisms, pollinate flowers, and are easy to attract to a garden or landscape. Butterflies and moths are found throughout Georgia and will flourish within a well-designed landscape of native plants in both rural and urban settings.

Life Cycle. Butterflies and moths are unique because they change from a caterpillar to a winged adult through a process called metamorphosis. A typical moth or butterfly's life begins as an egg, generally laid on the leaf of a host plant. A host plant is a plant that provides the food source for the larval form, a caterpillar. Butterflies pollinate the plants as they take breaks from egg-laying to sip upon nectar. Eggs soon hatch into caterpillars, which act as eating machines to devour leaves of the host plant. Caterpillars often have very specific food requirements that restrict them to a particular plant. After a few weeks, the caterpillar molts into a hard protective casing, called a pupa or chrysalis. At the end of approximately two weeks, the adult emerges from the chrysalis, spreads and dries its wings, and begins searching for food and a mate. Following successful mating, the female begins her search for a host plant on which to deposit her eggs, and the life cycle begins again. Most species of butterflies and moths

survive the winter by hibernating as caterpillars, pupae, or adults. Those species that spend the winter as adults tuck themselves behind loose bark or in tree cavities. They emerge in search of sap or rotten fruit on warm, sunny days. A few spend the winter as eggs. Fewer still migrate to warmer climates (e.g. monarchs). Depending on the species, adult butterflies and moths can live from one week to nine months.



It is a good idea to learn the larval form of a butterfly species so you do not confuse it with a garden pest. Above is the caterpillar of the gulf fritillary (*Agraulis vanillae*) which can be seen below in adult form.



Creating Butterfly-friendly Habitat

Creating butterfly habitat is an exciting and rewarding experience, in addition to providing an invaluable conservation tool! Beginning a butterfly garden can be as simple as choosing native flowering plants that will invite adult butterflies

and moths into your garden to feed. However, if you truly want to create butterfly and moth habitat, which can serve as a sanctuary for these beautiful and graceful animals, you will need to consider the following guidelines. Keep in mind that an effective butterfly and moth habitat will provide everything the butterfly and moth need to complete their life cycle. This includes shelter, water, sun, and a diverse group of native plants for both adult and larval butterflies and moths.

- Identify and protect butterfly and moth habitat already in place. Existing butterfly and moth nectar and larval native plant sources can often be found near fencerows or hedgerows, riparian buffers, and other natural areas where a variety of plants



Butterflies and moths often require entirely different plants during their different life stages. For example, monarch butterfly (*Danaus plexippus*) adults can forage for nectar on many different plant species, but monarch larvae require host plants in the milkweed (*Asclepias*) genus.

grow. Protect these sites and their flowering plants.

- Use locally adopted native plants to attract butterflies and moths. Because butterflies, moths and native plants depend on each other for survival, using a wide variety of native plants is imperative. Native plants are those plants that occurred in the region prior to European settlement. Plants native to your area grow well because they are specifically adapted to the climate, soils, temperature, and precipitation. Native plants are those upon which regional butterflies and moths have adapted, and therefore, they are ideal for butterfly and moth habitat and for larger restoration projects. In addition, these plants require relatively little maintenance, watering, or care because they are adapted to the local area. Do NOT dig native plants from the wild and transport them unless the site in which you find them is in danger of being destroyed. Always get approval of the landowner if you are planning to “rescue” native plants from development.
- Ensure that a variety of both adult nectar and caterpillar host plants are available.

David Herlocker, a naturalist for eNature.com, explains that butterflies and moths exhibit very specific preferences regarding which plants they use for feeding, laying eggs, and resting: “I cannot stress enough that nectar plants for adult butterflies are entirely different than the host plants sought by larvae for food. Food-source plants for the caterpillar are quite specific to species as well as region, while an adult butterfly might usurp nectar from any alluring, flowering plant. The adult demonstrates her finicky side instead when choosing where to lay her eggs.”

The relationship between butterflies and moths, caterpillars and the plants they use for food is not a casual one. It is a relationship created over thousands of years as flowering native plants evolved alongside insects. As a result of this long evolution, caterpillars will use only certain plants for food. At the same time, butterflies are equally

picky about which plants they will select to lay their eggs on. Thus, in any given locale, the butterflies and moths have adapted to their native surroundings, evolving in tandem with plants and creating a unique butterfly-plant relationship. Please note that many of the host plants that butterflies and moths have evolved with include trees, shrubs, and vines as well as the native herbaceous perennials, annuals, and biennials.

- Provide butterflies plenty of sun. It is essential that your butterfly habitat is in a sunny location. Butterflies are cold-blooded insects that often start their day by warming their bodies in the sun. Thus, most butterflies are active only in the sun, and many butterfly larval and nectar plants require sunny habitats. Be sure to include a spot in the garden where sunlight will reach the ground early in the day. Provide a few large flat rocks for butterflies to perch on while basking in the sun. In addition, exposed soil or even hard surfaces will warm up in morning sunlight and provide additional basking opportunities. Try to locate your garden where it will receive at least six hours of direct sunlight each day.
- Provide shelter from wind, rain and predators. While you may think that shrubs and trees create unnecessary shade, they do provide an important feature in the butterfly garden. Properly placed, trees and shrubs will shelter your butterfly habitat from rain and wind, which makes it easier for butterflies to explore your area. Additionally, trees and shrubs give valuable shelter where butterflies can roost at night or hide from predators. In addition, remember that many shrubs and trees are also caterpillar host food plants! You can provide shelter for the butterflies and moths in your habitat by leaving snags (standing dead trees) or a brush pile.
- Provide water sources. Nectar, dew, and tree sap provide butterflies with moisture

but puddles and moist dirt or sand are also popular water sources. “Puddling stations” can be as simple as a damp area of ground covered with sand. Placed where they are easily viewed and sheltered from the wind, puddling stations are thought to provide butterflies dissolved salts in addition to water.



‘Puddling stations’ can be an excellent method to help butterflies find water and dissolved salts. The butterflies pictured are eastern tiger swallowtails (*Papilio glaucus*).

- Buy native plants based on ecotypes. Whenever possible, buy native seed or native plants from a reputable nursery that sells local ecotypes (plants propagated from seed or stock originally collected in the area you plan to plant rather than in another biogeographic region). Often plants sold as native are not from local sources, and thus may not give you the full benefits of easy growing and pollinator forage. In addition, always check the scientific name of a plant to the common name at the nursery in order to confirm the plant you are buying is truly the one you desire for your landscape.
- Do not use invasive plants. Avoid plant species known to be highly invasive. These plants do not provide the quality nectar that the pollinators depend on, will likely spread and dominate other species, reduce the diversity and value of the habitat, and increase maintenance demands. For more information and sources on invasive plants,

check out the EcoScapes website by Googling “UGA EcoScapes”.

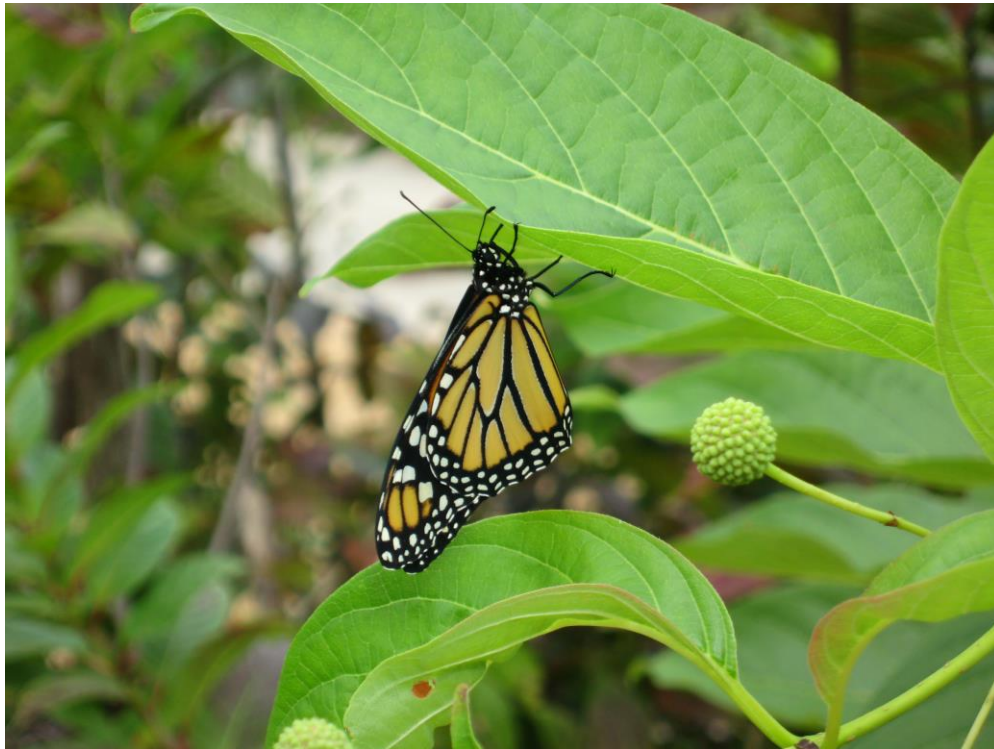
- Choose plants with a diversity of color. Butterflies are guided to the nectar source by colors and patterns. Thus, choose flowers with bright colors such as pink, orange, yellow, purple, blue, and violet (white is also an option).
- Place plants that bloom simultaneously together. Clusters of flowers attract more pollinators than individual blooms. More specifically, concentrate flowering plants with similar bloom times to allow butterflies easy access to seasonally abundant nectar sources without excessive movement and increased exposure to predators. However, when it comes to planting caterpillar food plants, scatter the plant groups around the landscape. If plants are grown in more than one small location, the caterpillar eggs are less vulnerable to predators. Many butterflies will choose to lay their eggs on plants that already do not have eggs on them.
- Include flowers with blooms of different sizes and depths. Butterflies and moths are all different sizes, have different proboscis lengths, and consequently, will feed on different shaped flowers. For example, smaller butterflies, such as hairstreaks and skippers, have shorter proboscises and are unable to reach the nectar in larger blooms. Larger butterflies, such as swallowtails, favor larger blooms. How large, how spiky, or how dense the plants grow may also be a factor in which plants to choose. By choosing plants that grow to different heights, such as shrubs, trees, perennials and vines, with a variety of flower shapes and colors that have different blooming times, you will be creating a garden that is attractive to a wide range of butterflies and moths.
- Have a diversity of plants flowering all season. Different species of butterflies and moths can be seen anytime between early spring and late fall – maybe longer in coastal Georgia – so a sequence of plants providing a diversity of flowers throughout the growing season will support a range of butterflies and moths that are active at different times of the year.
- Avoid hybrids. Avoid planting hybrid flower varieties or those that have been bred for showy or “double” blossoms, as these often lack the nectar rewards of the parent species, and may also lack the fragrance that butterflies may be drawn to. In addition, horticultural varieties and hybrids are not necessarily suited to local conditions. Research suggests native plants are four times more attractive to butterflies than ornamentals and exotics.
- Provide mulch or low growing ground covers around the base of the host plants. Many caterpillars spend time hiding on the ground next to the host plant during the day and feed only at night. Other caterpillars use the soil around the base of the host plant when it is time to pupate.
- Try to disturb the soil and mulch as little as possible in the fall. Leave as much dried matter (grasses and dead perennial plant stems) in the garden as you can tolerate. Although it may not look too tidy, many types of caterpillars need this plant material to survive the winter.
- Provide additional food sources. Peelings and cores of fruit (peeled, overly ripe bananas work well) can be discarded in partially shaded nooks in the garden where they will attract butterflies that eat rotting fruit. Adult butterflies may also feed on tree sap.
- Eliminate the use of herbicides and pesticides to ensure butterfly, moth and caterpillar survival. Whenever feasible, choose non-pesticide solutions first. Both insecticides and herbicides can be harmful to butterflies, moths, and caterpillars. While herbicides don’t directly target pollinators, they can destroy plants that provide nectar and food, forcing butterflies and moths to forage more widely for food. This requires more energy and exposes them to more threats, and as a result, they

produce fewer offspring to emerge the following year. Insecticides, on the other hand, target insects and, depending on the active ingredient and how it is formulated and applied, have a wide range of toxicities to butterflies and moths. Foraging pollinators are poisoned by insecticides when they absorb the fast-acting toxins through their exoskeleton, drink toxin-tainted nectar, or gather polluted pollen or micro-encapsulated insecticides. Even sublethal doses of insecticides can eventually kill butterflies and moths by affecting their behavior. Butterflies that

are exposed may have trouble navigating their way back to shelter after foraging, or they may; simply be unable to fly.

For more information regarding Georgia's native plants, to utilize the EcoScapes native plant search engine website, or to learn how to further promote and protect pollinators, go to the EcoScapes website:

www.gacoast.uga.edu/outreach/programs/ecoscap.es/.



Monarch butterfly (*Danaus plexippus*) resting on common buttonbush (*Cephalanthus occidentalis*)
Source: Kevin Brooks, EcoScapes Native Plant Demonstration Garden



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